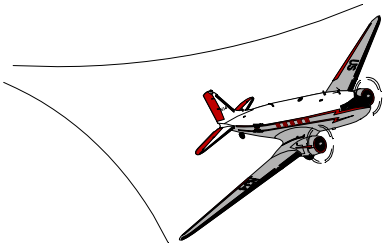
SPECIAL AIRWORTHINESS INFORMATION BULLETIN

Aircraft Certification Service
Washington, DC



U.S. Department of Transportation

Federal Aviation Administration

CE-05-76
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www.faa.gov/certification/aircraft

This is information only. Recommendations are not mandatory.

Introduction

This Special Airworthiness Information Bulletin (SAIB) provides safety information to you, owners and operators of **airplanes equipped with Garmin AT, Inc. GDL-90 Automatic Dependent Surveillance Broadcast (ADS-B) surveillance systems** installed in accordance with **Supplemental Type Certificate (STC) SA02217AK.**

Background

Analysis of flight monitoring data has revealed an increase in the number of ADS-B surveillance systems experiencing loss of global positioning system (GPS) position information. The loss of GPS position information has been mainly attributed to Electro-Magnetic Interference (EMI) effects from non-aviation communication radios, especially marine band transceivers, on-board the aircraft. This results in a loss of Air Traffic Control (ATC) tracking capability for aircraft separation service.

Recommendations

We recommend that owners and operators of aircraft with Garmin GDL-90 UAT Data Link Sensors, P/N: 430-6081-100-000, comply with Garmin Installation Bulletin NO.: 0526, (attached) dated July 19, 2005, within 7 days of the release of this SAIB.

Title 14 Code of Federal Regulations require that radio equipment and installations in the airplane be free from hazards, in themselves, in their method of operation, and in their effects on other airplane components. In other words, non-aviation radios or radios that are not intended for aircraft operation are required to demonstrate that they do not adversely affect essential equipment on-board the aircraft, including affects caused by EMI. Compliance to this SAIB fulfills this requirement.

Further Information Contact

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INSTALLATION BULLETIN

NO.: 0526

TO: All Garmin GDL 90 Users, All Capstone Program Users, All Embry-Riddle Aeronautical University Users

DATE: July 19, 2005

SUBJECT: VHF Radio Interference with Operation of Airborne ADS-B Equipment

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PURPOSE

Radio transmitters not installed via an STC approval or tested to demonstrate compatibility with airborne ADS-B equipment must be retested to insure the integrity of the airborne ADS-B surveillance system. This bulletin provides a procedure to test the compatibility of transmitting radios with GPS equipment that is installed as part of the aircraft's ADS-B system.

DESCRIPTION

It is known that certain non-aviation radios, including marine transceivers, can interfere with civil aviation navigation and surveillance equipment including the Garmin GDL 90. When installing GDL 90 equipment in accordance with STC SA02217AK it is the responsibility of the installer to ensure that the GDL 90 modification is compatible with all previous aircraft modifications. Garmin recommends that whenever a GDL 90 is installed in an aircraft that has been modified with non-aviation radios, particular care should be exercised to verify that these do not interfere with proper function of the GDL 90. Special care should also be taken to ensure that there is no interference with the GDL 90 if non-aviation radios are installed in an aircraft after a GDL 90 has been installed. If interference is found, it can be addressed by relocating antennas, rerouting cables, using filters to attenuate unintentional harmonic frequency transmissions, or using various other techniques for elimination of the interference. It may be necessary to remove or replace the radio with a model that does not interfere with the proper functioning of the GDL 90.

PRODUCTS AFFECTED

GDL 90 UAT Data Link Sensor (Garmin AT P/N 430-6081-100-000 or later; Garmin P/N 013-00176-00 or later)

COMPLIANCE

MANDATORY

WARRANTY INFORMATION

This procedure is not warranty reimbursable.

REFERENCES

GDL 90 Installation Manual (Garmin AT P/N 560-1049-01 Rev A or later; Garmin P/N 190-00524-00 or later)

TESTING PROCEDURE

If the installation has an MX20 or GSL 71, the following procedure can be used.

1. Position the aircraft so that GPS satellites are visible.
2. Turn on the MX20 (or GSL 71) and GDL 90. During the initial GPS acquisition, the MX20 ADSB flag will be shown on the left side of the display. On the GSL 71, the UAT status will show the AQR flag.

3. Verify that the ADSB flag (or UAT AQR flag on the GSL 71) is off. Move the aircraft as necessary to improve the GPS satellite visibility.
4. For each radio transmitter on the aircraft, transmit a test signal at the radio's highest power setting for 15 seconds. Verify that while the radio is transmitting the ADSB flag (or UAT AQR flag) is not displayed. Wait approximately 15 seconds for the effects of any interference to subside before the next step.
5. Operate each radio transmitter on each channel or frequency in normal use at the highest power setting of the radio. Pay particular attention to frequencies that may contain harmonics of the GPS signal frequency. For example, test all channels in the region of 157.425 MHz (marine channel 88A), 131.25 MHz and 121.15 MHz (aviation). See Section 4.3.1.1 of the GDL 90 Installation Manual for a complete list of required aviation frequencies.
6. If the ADSB flag (or UAT AQR flag) is displayed, then the transmitter being tested is generating GPS interference, and its installation must be modified or it must removed or replaced. If the ADSB warning flag (or UAT AQR flag) is not displayed, the transmitter is acceptable on that setting.
7. All transmitters must be verified to not cause GPS interference before the installation is acceptable.

Further Reference Material (MX20 only)

If the installation has an MX20, the following alternate procedure can be used.

1. Position the aircraft so that GPS satellites are visible.
2. Turn on the MX20 and GDL 90. Go to the System Info screen. You can access this screen by pressing the FN key until **SYS** is displayed. Press the **SYS** smart key, then press the **INFO** smart key.
3. Under the 'Port Status' section of the System Info screen, locate the status of the GDL 90 GPS receiver. The status is determined by the NIC (Navigation Integrity Category) and NACp (Navigational Accuracy of Position) values. These values are dependent upon your geographical location, time of day, etc. Verify that these values are steady and not fluctuating. Verify that the ADSB flag is off, and that the NIC value is 8 or higher. Move the aircraft as necessary to improve the GPS satellite visibility.
4. For each radio transmitter on the aircraft, transmit a test signal for 15 seconds at the radio's highest power setting and observe the NIC and NACp values. Verify that while the radio is transmitting, the ADSB flag is not displayed, and the NIC value remains at or above the value 6. Wait approximately 15 seconds for the effects of any interference to subside before the next step.
5. Operate each radio transmitter on each channel or frequency in normal use at the highest power setting of the radio. Pay particular attention to frequencies that may contain harmonics of the GPS signal frequency. For example, test all channels in the region of 157.425 MHz (marine channel 88A), 131.25 MHz and 121.15 MHz (aviation). See Section 4.3.1.1 of the GDL 90 Installation Manual for a complete list of required aviation frequencies.
6. If the ADSB flag is displayed, or the NIC value falls below 6, the transmitter being tested is generating GPS interference, and its installation must be modified or it must removed or replaced. If the NIC value does not decrease and the ADSB warning flag is not displayed, the transmitter is acceptable on that setting.
7. All transmitters must be verified to not cause GPS interference before the installation is acceptable.